



Increasing Return: Supply Chain Economic in the Development of Indonesia' Defense Industry Independence

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Abstract

The purpose of this study discusses increasing returns: economic supply chain in the development of the independence of the Indonesian defense industry. This research is a qualitative research, the type of research uses a comprehensive analytical study and analytical normative approach. The concept of supply chain economics shows that integration and harmony between engineering fields with economic and social science are very important to be reconstructed to produce Indonesia's best economic competition performance. Independence in making defense equipment must continue to be utilized and developed. By making its own defense equipment, Indonesia will get various benefits, from the economic benefits of the emergence of defense industry clusters that will help drive economic growth, provide plenty of jobs, and enhance technological capabilities. Technology is an aspect that can distinguish a country's defense capabilities from other countries. If the mastery of technology can be carried out by defense industry players in Indonesia, this will be a big advantage for Indonesia's defense forces. Guiding corporations or defense companies is as important as industrial coaching. Defense industry companies actually become a vehicle and the spearhead of the formation of an independent, professional, efficient, modern, and innovative defense industry as well as implementing good corporate governance. Corporate development can include aspects of strategy, managerial, production, efficiency, and marketing.

Keywords: Defense industry, Increasing return; Supply chain economic

Abstrak

Tujuan penelitian ini membahas peningkatan imbal hasil: rantai pasok ekonomi dalam pengembangan kemandirian industri pertahanan Indonesia. Penelitian ini merupakan penelitian kualitatif, jenis penelitiannya menggunakan studi analitik komprehensif dan pendekatan normatif analitik. Konsep supply chain economics menunjukkan bahwa integrasi dan keselarasan antara bidang keteknikan dengan ilmu ekonomi dan sosial sangat penting untuk direkonstruksi untuk menghasilkan kinerja persaingan ekonomi terbaik Indonesia. Kemandirian dalam membuat alutsista harus terus dimanfaatkan dan dikembangkan. Dengan membuat alutsista sendiri, Indonesia akan mendapatkan berbagai keuntungan, mulai dari manfaat ekonomi munculnya klaster industri pertahanan yang akan membantu mendorong pertumbuhan ekonomi, menyediakan banyak lapangan kerja, dan meningkatkan kemampuan teknologi. Teknologi merupakan salah satu aspek yang dapat membedakan kemampuan pertahanan suatu negara dengan negara lain. Jika penguasaan teknologi dapat dilakukan oleh para pelaku industri pertahanan di Indonesia, hal ini akan menjadi keuntungan besar bagi kekuatan pertahanan Indonesia. Perusahaan pembimbing atau perusahaan pertahanan sama pentingnya dengan pelatihan industri. Perusahaan industri pertahanan sesungguhnya menjadi wahana dan ujung tombak pembentukan industri pertahanan yang mandiri, profesional, efisien, modern, dan inovatif serta melaksanakan tata kelola perusahaan yang baik. Pengembangan perusahaan dapat mencakup aspek strategi, manajerial, produksi, efisiensi, dan pemasaran.

Kata Kunci: isi, Industri pertahanan, Increasing return; Supply chain economic

Received : 10 May 2021; Revised: 7 June 2021; Accepted: 8 June 2021



Introduction

Technological innovation supported by a strong network is an important element in creating economic growth. Innovation is like a source of water a network is a channel that flows so that water can be enjoyed and provides welfare to many people. The nation's competitiveness is an important performance indicator that must be fought in the face of global economic competition. One of them is by strengthening the economic supply chain. The concept of supply chain economics shows that the integration and harmony between engineering fields with economic and social science is very important to be reconstructed to produce Indonesia's best economic competition performance (Hakim & Kartajaya, 2012).

In the world of biology, we know the term "hormone" as a trigger factor for cell growth. For example, plant hormones are endogenous, produced by the individual concerned, or exogenous, given from outside the individual system. Analogous to the world of biology, the world of economics and business also recognize 2 (two) growth models, namely endogenous and exogenous economic growth. Exogenous growth model, which is growth that is triggered by the ability of technological innovation. The growth of this innovation is the power of business systems to produce exponential growth, which is famous for its thematic jargon increasing.

Growth rate has become a strategic objective of almost all companies, especially those in the monopolistic competition structure, which is a market structure where a unique differentiation is needed to win the competition, a market that requires the concept of creativity and innovative implementation. Once the importance of the growth rate, so that the indicator "organic growth" which is the company's ability to enter new markets with new consumers is an important indicator. True, organic growth has become a key performance indicator (KPI) for "blue chip" companies everywhere, nationally, regionally and internationally (Hakim & Kartajaya, 2012).

Being independent is the most important form of independence. From the political side, as a neutral country that does not have serious conflicts with other countries and does not experience international pressure, Indonesia has its own discretion to create independence in making defense equipment. Beyond the existence of various barriers such as lack of resources, both financially, infrastructure, human resources, and technology, these factors of freedom must continue to be put to good use (Muradi, 2012).

Actually, independence in making this has long existed and utilized by Indonesia. Various defense industry players in Indonesia continue to produce various defense products until now, mainly through cooperation schemes, such as the cooperation of Airbus with PT DI and PT Pindad with FNSS Turkey (Karim, 2014).

Independence in making defense equipment must continue to be utilized and developed (Hartanto, 2013). By making its own defense equipment, Indonesia will get various benefits, from the economic benefits of the emergence of defense industry clusters that will help drive economic growth, provide plenty of jobs, and increase technological capabilities, to the advantage of Indonesia's defense strength (its strength becomes more not easy to read compared to if using various defense equipment from other countries).

The economic advantage of having another domestic defense industry is export potential. The market for weapons and defense equipment in the world is still wide open (Azzelini & Kanzleiter (ed.), 2005). With a serious commitment to find and have certain competitive advantages, Indonesia can utilize the defense industry as one of the export commodities that can contribute foreign exchange to the country. If so far, Indonesia has played more and more role as an importer in the defense industry, opportunities and determination as an exporter of defense equipment must also be utilized and sought.

Today's domestic defense industry companies, especially state-owned companies, are able to create jobs for thousands of workers in Indonesia. Studies related to the defense industry at leading universities in Indonesia provide graduates to fill various positions in these companies. In the future, the growing defense industry in Indonesia will be able to provide wider employment for our educated workforce (Karim, 2014).

Another important advantage of independence in the domestic defense industry is the emergence of skilled human resources in the defense industry. These expert human resources will emerge along with the development of an increasingly advanced defense industry (Suryohadiprojo, 2010). The increasingly developed and developing defense industry will provide space for researchers and scientists to work in their own country.

The purpose of this research is to discuss increasing yields: the economic supply chain in developing the independence of the Indonesian defense industry. The concept of supply chain economics shows that integration and alignment between the fields of engineering with economic and social sciences is very important to be reconstructed to produce the best economic competitive performance in Indonesia.

Method

The purpose of this research is to discuss increasing yields: the economic supply chain in developing the independence of the Indonesian defense industry. This research is a qualitative research. This type of research uses a comprehensive analytic study and an analytical normative approach. The research specifications in this study use descriptive analytics, which describes the results of the study in accordance with the problems and objectives to be achieved and analyze them. Data analysis (analyzing), which describes the data in the form of sentences that are good and correct, so that it is easy to read and given meaning (interpreted) so that the results of data analysis facilitate inductive conclusions. Materials (data) from the results of the processing are analyzed qualitatively and then discussed. Based on the results of the discussion then conclusions were taken as answers to the problems studied.

Result and Discussion

In understanding increasing returns, we need to review the classification of economic growth as follows: (1) diminishing returns (2) constant returns, and (3) increasing returns. The third classification of economic growth will be related to the quality of productivity of each of the characteristics of the resulting growth.

Diminishing returns introduced by Marshall and formalized in the industrial revolution era will occur if the percentage increase in output is lower than the percentage increase in input, or the number of output decreases with a fixed number of inputs, which means a decrease in productivity. Diminishing return concluded by Brian Arthur is the traditional side of economic activity in the form of the processing industry. The constant returns occur when the percentage increase in output equals the percentage increase in input, which means constant productivity (Hakim & Kartajaya, 2012).

Increasing returns actually did not revolutionize the standard theory of diminishing returns previously as John Hicks's British economic assumption, but increasing returns according to Brian Arthur occur in industries that are based on knowledge, and become a complement to the concept of diminishing returns. Increasing returns occur when the percentage increase in output is greater than the percentage increase in input, which means that productivity is increasing due to innovations made (Hakim & Kartajaya, 2012).

Capital-intensive manufacturing sector with the application of advanced technology, such as the electronics industry, machinery and machine tools, the defense industry, and many others, has the characteristics of increasing returns. Productivity in the industry

increases returns can be increased continuously with technological innovation. Therefore, a country can only advance and prosper if it can build an industry with significantly increasing characteristics in economic development.

Law Number 16 of 2012 concerning the Defense Industry mandates increased capability and mastery of the technology of the defense industry which is carried out through research and engineering through the national system. The mandate in the law affirms that mastery of technology has indeed become one of the important keys in the defense industry and national defense issues in general (Widjajanto & Keliat, 2006). Technology is an aspect that can distinguish a country's defense capabilities from other countries. If the mastery of technology can be carried out by defense industry players in Indonesia, this will be a big advantage for Indonesia's defense forces.

Guiding corporations or defense companies is as important as industrial coaching. Defense industry companies actually become a vehicle and the spearhead of the formation of an independent, professional, efficient, modern, and innovative defense industry as well as implementing good corporate governance. Corporate development can include aspects of strategy, managerial, production, efficiency, and marketing.

Mastery of technology that continues to develop will provide long-term benefits in the form of superior defense equipment compared to other countries. This has been proven by developed countries, which have defense industry players who are also advanced and mastering advanced technology (Hayward, 2000).

By mastering the highest hierarchy in defense technology, a powerful country like the United States is able to become the most powerful defense system. At present, with the tendency to spread and master technology from west to east, Asian countries like Indonesia have the opportunity to continue to develop their defense technology. With the ability of domestic defense industry players in terms of ownership and mastery of their own technology, Indonesia's defense capability will also increase. Because, with technological independence, Indonesia's defense forces will not be easily readable by other countries (Karim, 2014).

Supply Chain Economic

How to produce increasing economic growth? The answer to this question is how well a country (at the macro level) and company / aggregate companies (at the micro level) have the ability to build a Supply Chain Economic, hereinafter abbreviated as SCE. SCE as a form of Supply Chain Economic as widely introduced in Southeast Asia by Sutrisno (Gajah Mada University) although it looks similar to the concept of smiling curves and value added curves per employee of economist Michael Porter (Harvard Business School), but when examined has a different spirit in the importance of strengthening the "economic engine" (Hakim & Kartajaya, 2012).

The defense industry, like an industry, experiences a growth process to mature. Industrial development in each country is not the same. The emerging defense industry in several countries, obviously requires time to be able to compete in international markets. Thus, it is interesting to observe the defense industry cycle and how this industry can be independent and able to compete. Sometimes the defense industry is built only to meet certain needs of the military, without any intention of internationalization or export, there are even countries where the defense or military needs are not done alone, but in cooperation with the defense industry of other countries (Joint ventures) (Yusgiantoro, 2014; Intriligator, 1990).

If you look at defense equipment manufacturers that now exist, the expected defense industry cluster is actually not destroyed. There are several SOEs that can be the main component industry / supporting or supporting components. PT Dahana, for example, produces explosives and bombs. There is also PT LEN, which manufactures communication equipment, both manpacks, base stations and mobile, surveillance equipment, combat management systems, and solar electricity systems. While PT Inti makes surveillance systems, next generation video messaging systems, and the like. Don't forget PT Krakatau Steel, a BUMN that produces various types of steel, can become one of the supporting and supporting industries. PT Barata Indonesia produces basket bombs, smart bombs, and heavy equipment (Karim, 2014).

The current condition is that other BUMNs have not been directed to be part of the supporting and supporting clusters. PT Inka, which manufactures passenger and freight cars; PT Boma Bisma Indra, which manufactures power generation equipment and plant equipment; and PT Dok Perkapalan Koja Bahari, PT Dok Perkapalan Surabaya, and PT Industri Kapal Indonesia, which produce landing ships, patrol boats, cargo ships, fishing

vessels, tugs and repowering KRIs, must be synergized to create a cluster of primary equipment industries. Seeing the severity of defense SOEs, efforts to create a defense industry cluster must involve BUMS (Karim, 2014).

At present there are several BUMS that produce alpalhankam, namely CV Sari Bahari, which manufactures training air bombs, PT Daya Radar Utama (tank transport vessels), PT Lundin Invest (vehicle for trimaran missile and catamaran fast vessels), PT Palindo (vehicle for missile 40) meters and patrol boats), PT Sentra Surya Ekajaya (rantis), PT Infoglobal (avionics), PT CMI (radar, VSAT for ground segment satellites), PT Langit Biru (people's air umbrellas), PT Saba Wijaya (bulletproof helmets), PT Maju Mapan (field tents), PT Sritex and PT Famatex (official clothing, official clothing fabrics, fabrics), and PT Jangkar (rations / food).

Supply Chain Economic Curve

The Economic Supply Chain curve introduced by Sutrisno consists of 2 (two) main components, namely the technology supply chain and technology management. It is this component of technology supply chain business growth and technology management that will construct the economic supply chain, the process of economic growth generated by the multiplier effect of the supply chain itself (Hakim & Kartajaya, 2012).

The technology supply chain is the technological requirements of the process or manufacturing stage, followed by brand packaging or assembling processes, distribution logistics and finally sent to consumers or exported by marketing. Furthermore, to survive in global competition, products require continuous innovation. Innovation will require technology management to produce new processes or new technologies.

According to Sutrisno, the process of developing technology supply chains, technology management, and economic supply chains is not important for developed countries whose business cycle processes are well established, but it is very important for developing countries that require government policy intervention in building incubators, techno parks, Industrial zones, and other economic zones. With the development of this SCE, it is expected that the "economic engine" of developing countries will absorb significantly more profit-sharing contributions from foreign investment (Hakim & Kartajaya, 2012).

Integration is a merger of two or more companies to achieve the level of effectiveness and efficiency of production. Both integration and merger can be done vertically or horizontally. The intended vertical is a merger of companies that are interconnected but not the same type, but the production process chain from upstream to downstream. Whereas for horizontal, the merger occurs because of the same type of business in the final product (Yusgiantoro, 2014).

Vertical integration can be explained as the merger of two or more companies that have a sustainable (chain) production process. This, will guarantee the availability of defense equipment components. The Law on Defense Industry, explains in detail the various components used to produce defense equipment. *Alutsista* produced from companies engaged in downstream activities (lead integrators) will get a guarantee of the supply of main components, supporting components, and raw materials from companies engaged in more upstream activities. Added value and competitive prices can be obtained in vertical integration by eliminating various costs, such as transaction costs. There is not much in the defense industry that secures chain production processes with the principle of joining upstream industries in vertical integration, supporting industries, such as the steel industry, avionic / electronics, and machinery for building warships, rarely merging until integrated vertical is relatively small when compared with the costs needed to build defense equipment, for example is the construction of warships or fighter planes, where the largest portion of the cost lies in the main components, supporters, and raw materials.

In addition, supporting industries are not easy to be in locations that are close to the location of the defense industry. Figure 1. shows the relationship between a defense industry with upstream and downstream industries. The multiplier effect on the upstream industry is called forward linkage whereas the downstream industry is called backward linkage. Quantitatively, it can be estimated how much this connection occurs, backwards and forwards. In the defense industry, forward linkage is not as large as backward linkage. Downstream industries from the defense industry are often found in the service, spare parts, and maintenance and maintenance industries (Yusgiantoro, 2014).

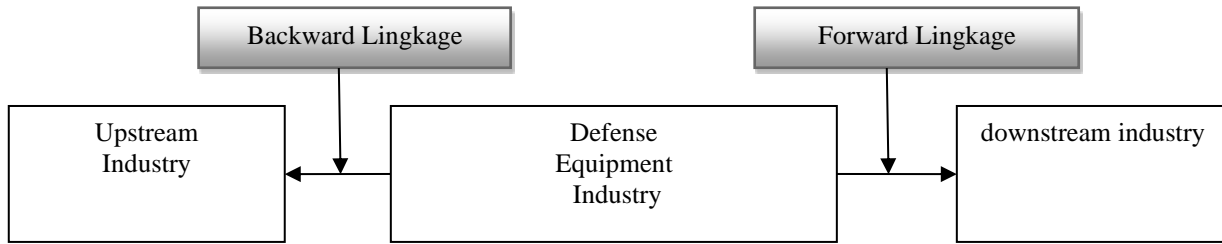


Figure 1. Forward and Back Multiplier Effects

Motivation of vertical integration according to Greer (1984) can be used for research and development; opening new markets that efficiently ensure the availability of raw materials, and ensure access to consumers; conduct transfer pricing for business actors; and reducing or eliminating competitors in the market. The advantage of mergers is to reduce sales costs; reduce consumer flexibility in purchasing; improve coordination in production, between functions and technological capabilities; and protect property rights. However, mergers are lacking in integrating various operations and the amount of financial burden when starting a business.

Horizontal integration is a combination of two or more companies that have the same process and production results. Companies that are active in upstream activities join companies that conduct upstream activities, as well as companies that are engaged in downstream activities. With horizontal integration, a company can increase market share and reduce costs, so that it can compete with other companies. This tendency occurs in the defense industry that is heading towards economies of scale, as is the case in Europe, a merger between several airlines that are also partly active in the defense industry, for example the Airbus Military Industry (AMI) which produces defense equipment. Incorporation also occurred in the manufacture of fighter aircraft, attack helicopters and assault (Yusgiantoro, 2014).

Likewise, horizontal integration motivation is a strategy to gain company ownership and reduce market competition. In addition, the motivation of horizontal integration has the advantage of better allocation of production factors, namely first, controlling the market. Second, the economic scale of each work unit or company, and can reduce marketing costs. In addition, horizontal integration motivation also has shortcomings, namely creating dependency, that is creating dependency with one another, and can form a monopoly market.

The government has an important role in building the defense industry, because the government is a large buyer or sole buyer of defense equipment produced domestically (monopsony). The government can use its purchasing power to determine the size, ownership, structure, entry and exit processes, products, prices, efficiency levels, and even the profitability of the national defense industry (both BUMN and BUMS). The government can also regulate the national defense industry by controlling profits on government contracts (for example preventing profits or excessive losses). In addition, the government is also able to determine prices and profits from non-competitive contracts, so that it can influence the behavior of companies by favoring non-price competition (research and development), and can control arms exports, for example through licensing (Yusgiantoro, 2014).

Improving the Quality of Supply Chain Economic

If we have agreed that the main key to increasing competitiveness that is capable of producing economic growth that is increasing returns is SCE, then the next question is how to improve the quality of the SCE? There are many choices, both at the micro and macro level. At the micro level of the company, implementation of Supply Chain Management (SCM) to partnerships in the form of Joint business groups or similar can be a feasible option.

At the macro level of government policy, the implementation of synergies between academics, business and government, known as the triple helix, energy efficiency, electricity and mineral resources, improvement of national logistics systems, etc. can be done better.

Researchers, scientists, and innovators, or can be called "the epistemic community", are at the forefront of technological research and development activities. Formally, the Ministry of Research and Technology is the coordinator of research and technology development activities. However, in practice, various government research institutes, universities, and community formations have the freedom and academic freedom to conduct research in accordance with their core competencies and cooperate with other parties.

The Indonesian Institute of Sciences (LIPI), as a national research institute, has long cooperated with the Indonesian National Army. LIPI communicates intensively with the Research and Development Ministry of defense in research into measuring the speed of small caliber bullets, sending image data and making signal scrambling systems, robots, computer vision and robot image technology applications, computer vision technology

applications and image processing for navigation systems and automatic pilots for helicopters , and research on specialized batteries for military equipment (Karim, 2014).

In addition to research, LIPI assisted the TNI in testing anti-aircraft cannons, developing underwater communication technology, repairing software for flight simulators, radar modules, periscopes, and transferring knowledge about forest plants that were safe to be eaten by soldiers in operational tasks. LIPI has two excellent researches that can be utilized by the TNI and subsequently it is possible to be developed into a superior product of the Indonesian defense industry (Karim, 2014).

In the framework of improving the quality of the SCE, it is not possible for a developing country like Indonesia to be strong in all entities of the constituent components of the SCE. SWOT analysis is needed to take a priority role which will be focused on strengthening SCE. As an illustration, developed countries with Knowledge Based Economic (KBE) capabilities such as the US, Germany, and Japan have more focus on R&D and marketing components, while manufacturing activities are left to countries with low manufacturing costs such as China, Vietnam, and the Philippines. China (plus Taiwan) as a country with high economic growth also understands that to date they prefer to focus as a manufacturing partner from developed countries, while preparing themselves in the area of their R&D capabilities for a vision of the future. As we all know, Higher Education in the Chinese Science and Technology field has increased rapidly in the competition for world-class quality education. Malaysia has a different focus. Realizing the research qualifications and ability of its workforce is not as cheap as China, Malaysia chose to focus on the field of marketing, while preparing the quality of its science and technology research by printing thousands of Doctor of Science and Technology in supporting the Vision of Malaysia 2050.

Whatever the choice of focus, we can conclude that all countries are actually "eager" to strengthen all components in SCE, starting from the ability of research (upstream) to the strength of network marketing (downstream). This desire must indeed be planned with the right strategy and strong collaboration between academics, Business, and Government.

Technology Aggregation

Whatever our choice of focus in the stages of strengthening the SCE chain, the thing to remember for policy holders is the total economic contribution. Developed countries like the US use a measure of economic growth with GDP (GNP), which is the total contribution of native citizens of US citizens at home and US citizens abroad. This is reasonable, given the ability of the US to duplicate technology and business to all countries globally for a long time.

As for countries with limited technological "duplication" capabilities, it is more appropriate to use national contribution criteria such as PNB (Gross National Product). PNB which is an indicator of national income, where the value of goods and services that are counted is only goods and services produced by factors of production owned by residents of the country concerned, including those produced by citizens who are abroad, but do not include production results foreign companies operating in the territory of the country.

Another criterion proposed by Arman and Sutrisno (2012) is the aggregate contribution of technology. The technological aggregate in question is the "unity of the system" of supplying industrial products from a group of companies that form SCE product values ranging from upstream to downstream (Hakim & Kartajaya, 2012).

In each of these product value chains, there will be a key-driver industry that will be a leverage for the total growth in the technology unity group, making it possible to produce a multiplier effect of business growth that is increasing. By developing this clustering method, the economic contribution of each technology aggregate can be predicted more logically. Figure 2 below provides a simple illustration of the aggregate method of technology.

As shown in Figure 2, contributions from Aggregate A will be composed of Contribution A, contribution K, L contribution, and 60% XEF contribution. What is meant by Contributions XEF are Contributions X, Contributions E, and Contributions F. The concept of aggregate contributions will probably be able to have a very long chain, considering companies K, L, and E and F will also have complement companies that supply their raw material needs. It is necessary to be careful at the time of identification in order to obtain complete aggregation.

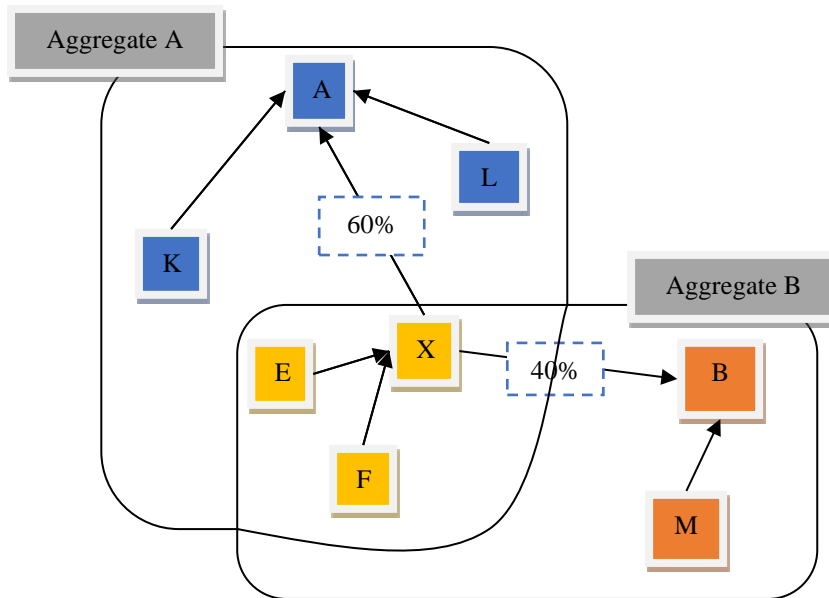


Figure 2. Simple illustration of an aggregate method of technology.

Example:

Industry X complements industry A, and industry B. industry X allocates 60% of its sales turnover to industry A, and 40% to industry B. aggregate A and Aggregate B each form a unified commodity supply system, namely product A and product B. Aggregate A and Aggregate B can interact with each other symbiotically, pure competition, or predator-prey, depending on the product characteristics of Industry A and Industry B.

Then:

Aggregate Contribution A = Contribution A + Contribution K + Contribution L + 60% XEF Contribution

Contribution of Group B = Contribution B + Contribution M + 40% XEF contribution

In addition, the grouping based on the contribution of this aggregate allows a combination of the process industry and the assembly industry (manufacturing), so there is no need to question the contribution of the economic effect of the dripping between the types of process and assembly industries.

The amount of economic contribution from each technology aggregate that has been identified will be defined as the amount of tax deposited in the region (net contribution) plus accommodation for the distribution of labor in the region plus its investment tax. The use of technology aggregate contribution criteria is able to show whether economic growth is not "buble", ie revenue growth that seems high but it turns

out that income is "outflow" because the portion of foreign investors is very dominant (Hakim & Kartajaya, 2012).

In industrial economic theory, each industry cluster has links (linkages) with other industry sectors. There are two types of linkages. First, backward linkages, which means that other industry sectors contribute inputs to the defense industry from their product output. The second is forward linkages, which shows the output of the defense industry can be an input for other industry clusters. If the independence of the defense industry becomes our common goal, efforts to synchronize backward linkages must be an important target. This is called local commercial off the shelf, that is, buying goods from private civil industries that are produced on the domestic market as inputs in the production of the defense industry. In general, the relationship diagram can be seen in infographic images 3 (Karim, 2014).

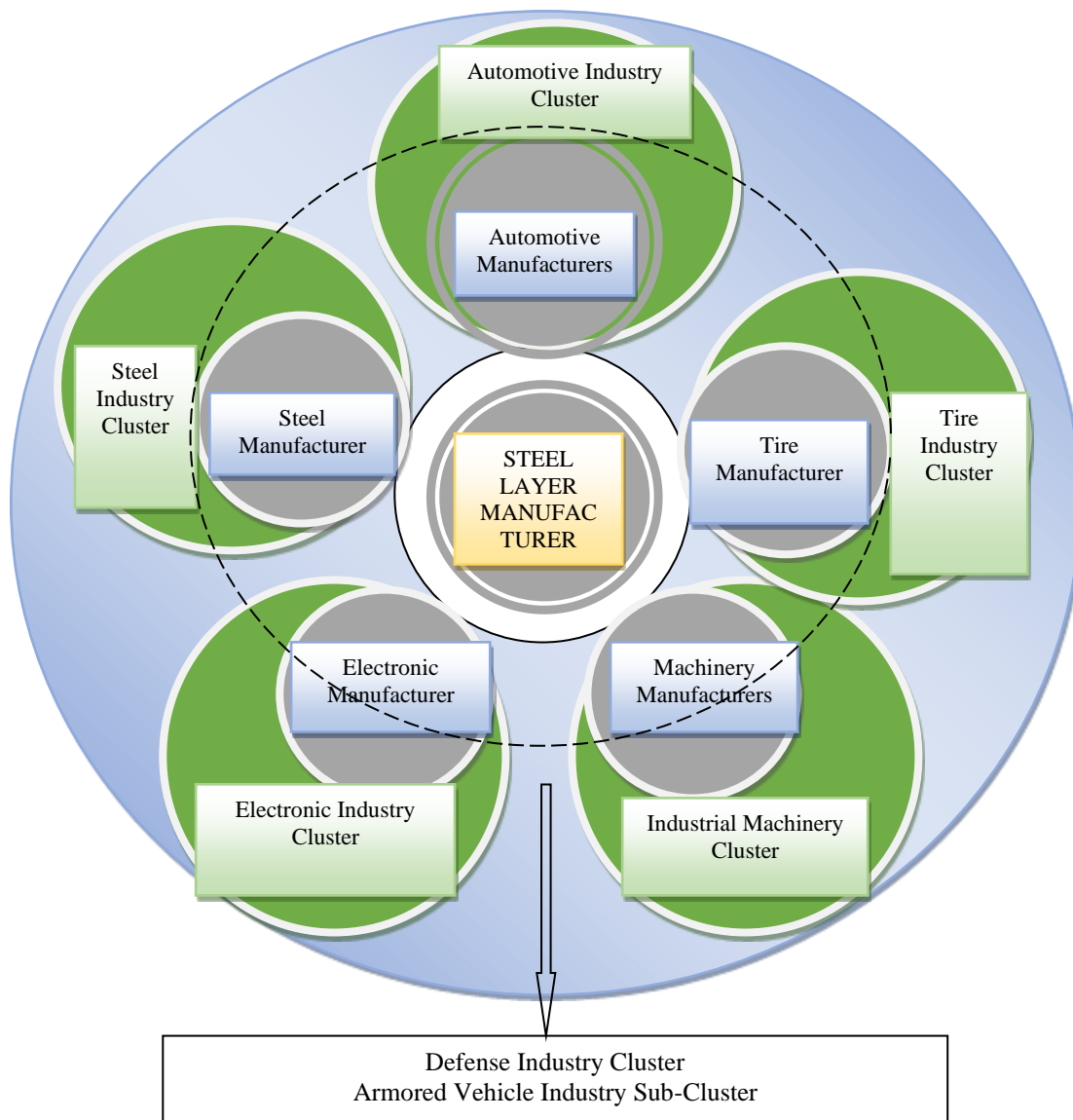


Figure 3. Defense Industry Linkages and Civil Industry Clusters

Take for example defense equipment in the form of armored personnel carrier (APC) produced by the defense industry which is a lead integrator of armored vehicle sub-clusters. This armored vehicle requires steel body components, tires, electronics, and machinery. If all of these components are to be taken from local companies, the armored combat vehicle manufacturers that are the main integrators of the cluster industry, especially tanks and outboard vehicles, must be supported by private commercial industries, namely steel producers, automotive and barreling companies, tire companies, machine manufacturers, and companies electronic. The problem is, each company is in a different industry coaching cluster.

In the blueprint of "Development of Priority Industry Clusters of Manufacturing Industry Basis" compiled by the government, steel companies are included in the national steel industry clusters, automotive and car body companies. automotive industry clusters, machine manufacturers enter the machinery and equipment industry clusters, electronics companies enter the electronic industry clusters, and tire companies enter rubber and its processed industry clusters (Ministry of Industry, 2009).

The challenge is to synergize industrial linkages, which involve non-defense industry clusters, so that they can produce commercial goods that meet the needs of the defense industry. In addition, the development of other commercial industry clusters must also be integrated, aligned, and in accordance with the stages of the formation of defense industry clusters, for example by focusing on industrial independence to be able to produce all products and value-chain stages from upstream to downstream (Karim, 2014).

The state must build a strong defense industry and national industry structure. This means the presence of deep and complete industrial tree products, from upstream products in the commercial civil industry to downstream products in the defense industry. The key word is to build a balance in the development of the domestic commercial and industrial defense industry. The stronger the relationship between defense industry clusters and commercial civil industry clusters, the stronger and more connected the contribution of value added from each cluster. The hope, increasingly integrated linkages of upstream products in the commercial civil industry to downstream defense industry products (Karim, 2014)

The initial step that can be done is to compile a map of the conditions and situations of national industries and related civil industry clusters. To what extent is the structure of the industrial cluster upstream, to what extent does each industry cluster dominate the industrial tree product chain, what is the local content level for each stage of the value added chain, these must all be mapped. From here you can compile a database of defense industry clusters. The presence of this database guarantees the availability of accurate information in analysis and policy making in the defense industry development plan. (Karim, 2014)

The government must also foster and strengthen the linkages of the defense industry cluster and the civil industry cluster at various business scales. Strengthening relations between industry clusters must involve the multinational network of companies that are in civil industry clusters to the networks of small and medium-sized businesses (SMEs) which are supporting industries of related commercial industry clusters. Including strengthening relationships with service sector activities that support it.

The government itself has planned to develop complementary and supporting component industries. The Ministry of Industry, for example, has planned that PT Indonesia Asahan Aluminium (Inalum), a newly acquired BUMN, from a Japanese company, will produce downstream aluminium products such as composite components for the manufacture of aircraft. Down streaming will be carried out in stages, from semi-finished products to the highest quality commonly used for the production of high-tech goods such as ships and aircraft.

PT Di also moved forward with the method of internationalization, plunging into the global supply chain, and building cooperation with large producers. In addition to producing aircraft, DI produces components for Airbus and Boeing. For Airbus, DI produces inverse outer fixed leading-edge components for A380 wings. The total orders reached 300 components with 36 shipments every year. There are also d-nose, pylon and leading-edge projects for the A320-A321 with an obligation to deliver 36 units per year, with the contract ending in 2015. Another project is the manufacturing of the Airbus A350 root end fillet fairing. DI also made a leading-edge skin for the Boeing 747 Korean Air, whose contract expires in 2017.

Conclusion

Increasing returns occur in industries that are based on knowledge / knowledge-based, and become a complement to the concept of diminishing returns. Capital-intensive manufacturing sector with the application of advanced technology, such as the defense industry, has the characteristics of increasing returns. Productivity in the industry increases returns can be increased continuously with technological innovation. Therefore, a country can only advance and prosper if it can build an industry with significantly increasing characteristics in economic development. The government has an important role in building the defense industry, because the government is a large buyer or sole buyer of defense equipment produced domestically (monopsony). The government can use its purchasing power to determine the size, ownership, structure, entry and exit processes, products, prices, efficiency levels, and even the profitability of the national defense industry (both BUMN and BUMS).

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